

short elimination half-time (8.5 hours) and is not available in parenteral form. In several case reports, perioperative hypertension occurred in patients after clonidine therapy was discontinued. However, in one controlled study only two out of ten patients had hypertension after clonidine was withheld preoperatively. The hypertensive response, if it occurs, can be managed with hydralazine or sodium nitroprusside. One group of investigators has recommended preoperative withdrawal of clonidine and propranolol, when they are given together, and substitution of hydralazine.

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Pharmacological Prophylaxis Against Acid Aspiration

THE RISK of pulmonary aspiration of gastric contents associated with general anesthesia is of major concern. The inhalation of gastric juice with a pH of less than 2.5 and in a volume exceeding 0.3 ml per kg of body weight results in a severe and intense respiratory distress syndrome. Maneuvers to protect and isolate the airway have been developed; however, accidental aspiration from either reflux or active vomiting still occurs. Therefore, pharmacological agents that will raise intragastric pH, hasten gastric emptying, elevate lower esophageal sphincter tone or decrease the volume of gastric secretion are being investigated.

Oral administration of antacid suspensions effectively raises intragastric pH and has become routine, if not obligatory, in patients at high risk for aspiration, such as pregnant women in labor. However, recent data suggest that aspiration of the antacid suspensions leads to a pulmonary syndrome as severe as acid aspiration itself, with more persistent pathological changes. Nevertheless, while clinical experience with antacid aspiration is limited and conflicting, the use of these agents in appropriate situations is still recommended.

Cimetidine, a gastric histamine H₂ receptor

antagonist, substantially elevates gastric pH in many situations when used as a premedicant. It has gained widespread usage, but its efficacy and safety in pregnant women has not yet been confirmed. Further, it does not reliably decrease the volume of gastric contents in preoperative patients and it prolongs the action of some benzodiazepines.

Metoclopramide, a chlorbenzamide derivative will be available soon in the United States. It is an antiemetic agent that accelerates gastric emptying by sensitizing gastric smooth muscle to the action of acetylcholine, as well as having a direct autonomic effect. It has been shown to be effective in pregnant women in labor.

Domperidone, an investigational drug, is a benzimidazole antiemetic that elevates lower esophageal sphincter tone. This agent may have a useful application after further clinical trials are completed.

Reduction in the volume of gastric secretions has been partially successful with anticholinergic agents such as glycopyrrolate. Glycopyrrolate also raises gastric pH in some patients. However, both glycopyrrolate and atropine decrease lower esophageal sphincter tone, thereby increasing the risk of reflux. This effect is antagonized by both domperidone and metoclopramide.

Meticulous attention to securing the airway mechanically is the key to the prevention of aspiration pneumonia. However, the use of one or more of the above pharmacological agents may provide extra protection to patients at high risk for aspiration.

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High Frequency Ventilation

TRADITIONAL MECHANICAL VENTILATION involves cuffed endotracheal tubes and large tidal volumes (12 to 15 ml per kg of body weight) given at slow rates (8 to 15 breaths per minute), with or without positive end-expiratory pressure (PEEP). It has been extremely successful in optimizing oxygenation in patients with serious lung disease, but it has serious drawbacks due to the high air-